

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

TRANSLATION

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing
(day/month/year)

Applicant's or agent's file reference
FP04-0164-00

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/JP2004/010503

International filing date (day/month/year)

23.07.2004

Priority date (day/month/year)

29.07.2003

International Patent Classification (IPC) or both national classification and IPC

Applicant

HAMAMATSU PHOTONICS K.K.

1. This opinion contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the opinion |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/IP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/010503

Box No. 1 Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language
_____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in the international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/JP2004/010503

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	2, 3, 5-11, 14, 15	YES
	Claims	1, 4, 12, 13	NO
Inventive step (IS)	Claims		YES
	Claims	1-15	NO
Industrial applicability (IA)	Claims	1-15	YES
	Claims		NO

2. Citations and explanations:

The following documents are cited in the ISR.

- Document 1: WO 96/36999 A1 (DR. JOHANNES HEIDENHAIN GMBH.), 09 May 1996
- Document 2: JP 2000-299489 A (Hamamatsu Photonics Kabushiki Kaisha), 24 October 2000
- Document 3: JP 2002-319669 A (Hamamatsu Photonics Kabushiki Kaisha), 31 October 2002
- Document 4: JP 2-185070 A (Matsushita Electric Industrial Co., Ltd.), 19 July 1990
- Document 5: WO 97/23897 A2 (DR. JOHANNES HEIDENHAIN GMBH.), 20 December 1997
- Document 6: JP 8-111542 A (Seiko Instruments Inc.), 30 April 1996
- Document 7: JP 5-136261 A (Kawasaki Steel Corp.), 01 June 1993
- Document 8: JP 8-293476 A (Hitachi, Ltd.), 05 November 1996
- Document 9: JP 6-310043 A (Sharp Corp.), 04 November 1994
- Document 10: JP 2000-100980 A (Mitsubishi Electric Corp.), 07 April 2000
- Document 11: JP 55-65448 A (Hitachi, Ltd.), 16 May 1980
- Document 12: JP 9-172029 A (Hitachi, Ltd.), 30 June 1997
- Document 13: JP 6-204336 A (Victor Company Of Japan, Ltd.), 22 July 1994

Claims 1, 4, 12 and 13

The inventions of claims 1, 4, 12 and 13 do not appear possess novelty based on document 6 cited in the ISR.

Document 6 (in particular Fig. 9) describes a window-plate bonded to the outer edge or a recess portion, document 6 (for instance, paragraph 0026) describes also bonding a window-plate by anodic bonding, which is equivalent to anodic-bonding a window-plate in the situation illustrated in Fig. 9.

Claims 2 and 3

The inventions of claims 2 and 3 do not appear to involve an inventive step based on documents 3 and 6 cited in the ISR. Figs. 1 and 4 of document 3 illustrate a resin film formed on the opposite side of a light-incident side, and illustrate further a filling electrode formed running through the resin film.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

Claims 5, 6 and 14

The inventions of claims 5 and 6 do not appear to involve an inventive step based on documents 3, 6 and 9-11 cited in the ISR. As described in document 9 (in particular paragraphs 0044-0045 and 0058), document 10 (in particular paragraph 0023) and document 11, carrying out anodic bonding via a member containing an alkaline metal and a metallic layer is an ordinary procedure which presents no particular difficulty.

Claims 7 and 15

The inventions of claims 7 and 15 do not appear to involve an inventive step based on documents 3, 6 and 9 -13 cited in the ISR. As described in documents 12 and 13, carrying out multiple-stage dicing using dicing blades of different thicknesses, for dividing thereby an element having side faces with multiple levels, is well-known knowledge.

Claims 8-10

The inventions of claims 8-10 do not appear to involve an inventive step based on documents 2, 3, 6 and 9 -13 cited in the ISR. Paragraphs 0009-0011 and 0018-0019 of document 2 describe increasing to a high density the impurity density of the bottom face portion of a recess portion, of the entire surface of the light-incident side of a substrate, and of the entire side faces of the substrate.

Claim 11

The invention of claim 11 does not appear to involve an inventive step based on documents 2, 3 and 6 -13 cited in the ISR. As described in documents 7 and 8, providing beforehand openings at the intersection points of dicing lines during dicing of a semiconductor element, so that the portions resulting from the dicing have a notched shape, is well-known knowledge.